

BORROWING PASS/FAIL DECISION WITH MITIGATION CRITERIA

INTRODUCTION

We used the IDIOM Decision Manager v4.1 to solve the problem scenario described in the Decision Management Challenge October 2014.

IDIOM Decision Manager is an integrated rules development environment which incorporates:

- ✓ Decision modelling.
- ✓ Formula modelling.
- ✓ A full set of validations.
- ✓ Onboard multi-level testing, including full regression testing.
- ✓ Schema management.
- ✓ Complete source code generation, deployment and reporting.

All actions are drag and drop – the only typing is for names and descriptions.

The full IDIOM product can be implemented by a novice user in less than 5 minutes on any Windows OS. There is no requirement for any third party tool.

The finished solution has been generated with a single click into multiple forms including Java, C#, and Logical English (See Appendix A).

THE DECISION MODEL

The decision model requires only one relatively simple decision.

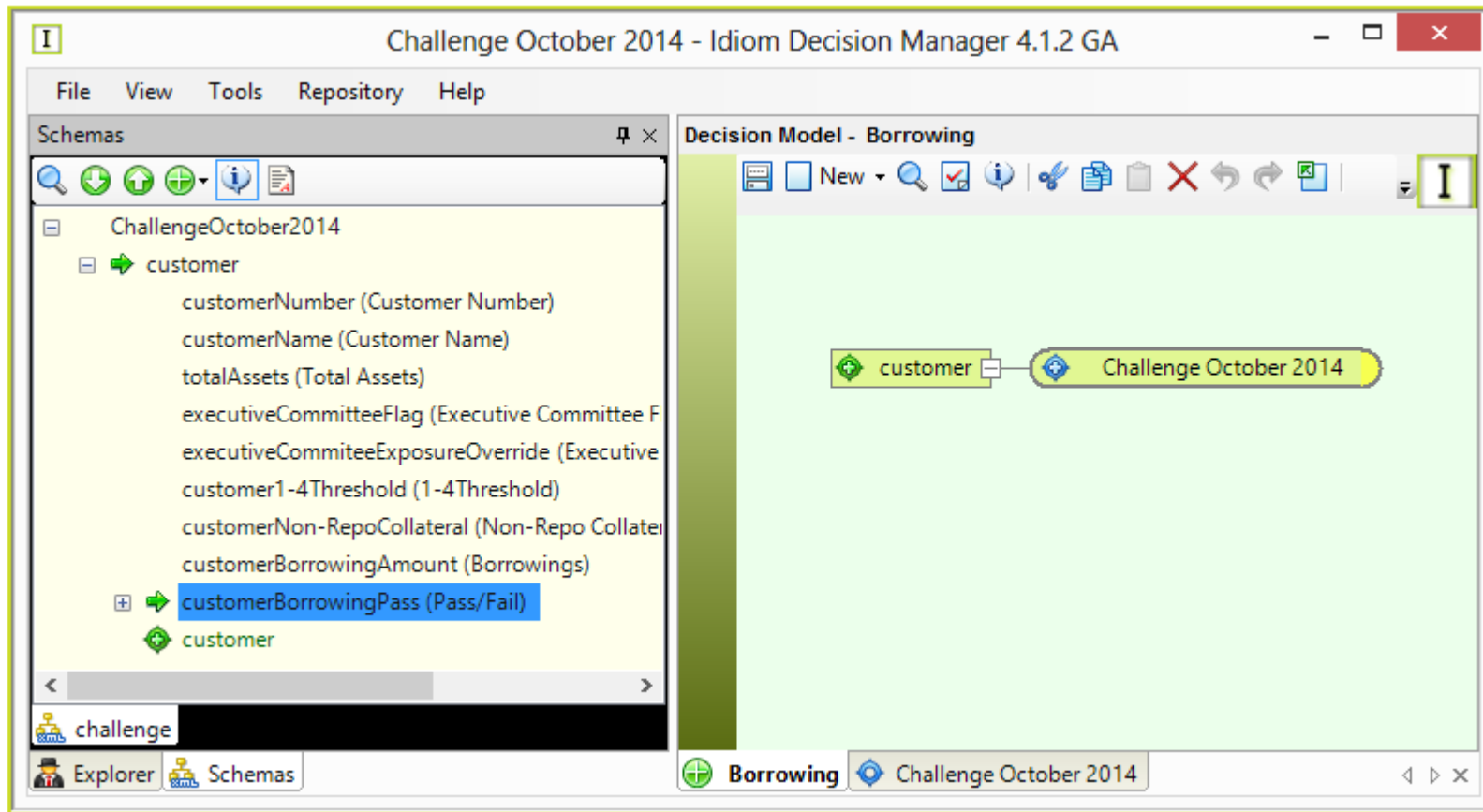


Figure 1: The decision model palette.

This Decision Model and its Formula will pass the transaction if it meets the criteria for both Rule # 1 and Rule # 2 (although this was not explicit in the challenge requirements)

THE FORMULA PALETTE

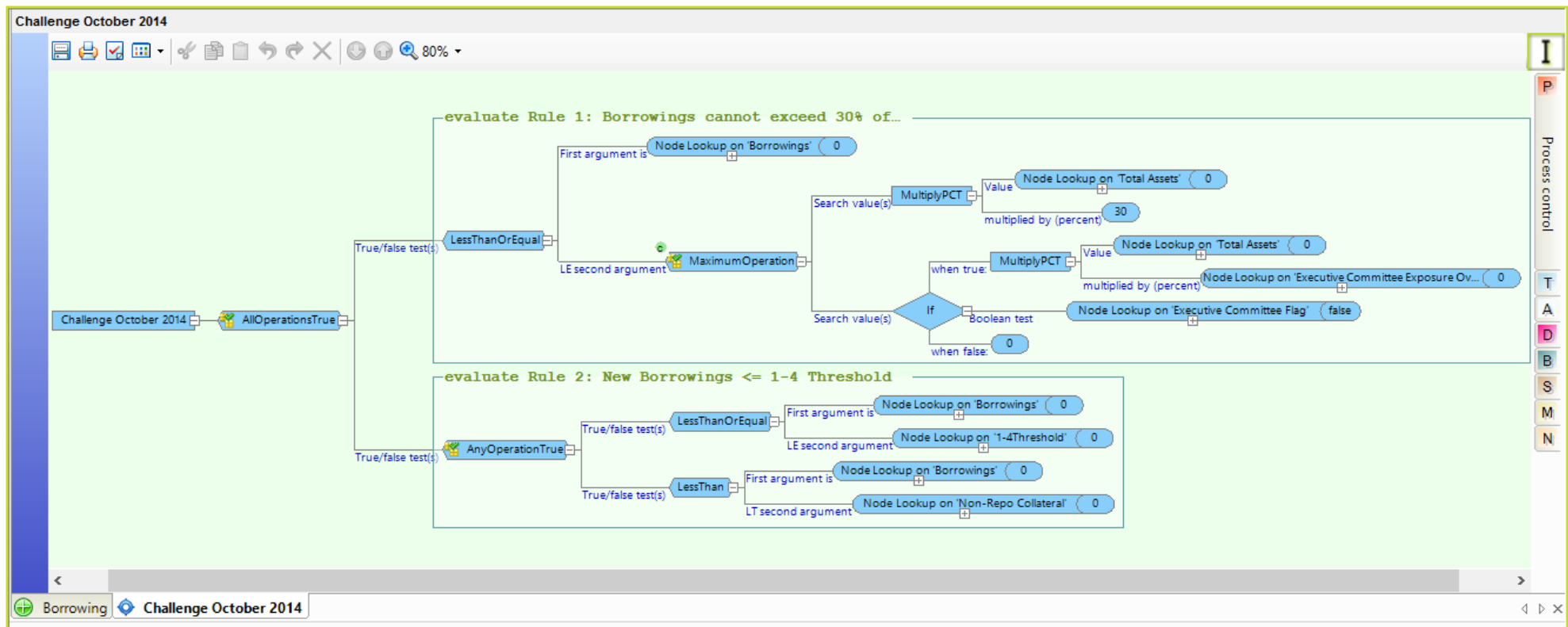


Figure 2: Rule # 1 and Rule # 2 Formula.

This formula assesses the criteria for Rule # 1 and Rule # 2 and will pass the transaction only if both conditions are met. i.e. the maximum borrowing amount for each customer is ultimately defined by the Non-Repo Collateral:

- ✓ ABC Bank: < \$2,500,000
- ✓ Bank One: < \$3,250,000

Change to the mitigation rules:

There are many ways to change the mitigation rules. Since we are not the authorized representative, we would not make this change without consultation.

However, an arbitrary example of an amended rule is shown below. In this case we have changed Rule # 2 to allow a 20% increase to the Non-Repo Collateral amount if the Customer's Total Assets exceed \$30,000,000.

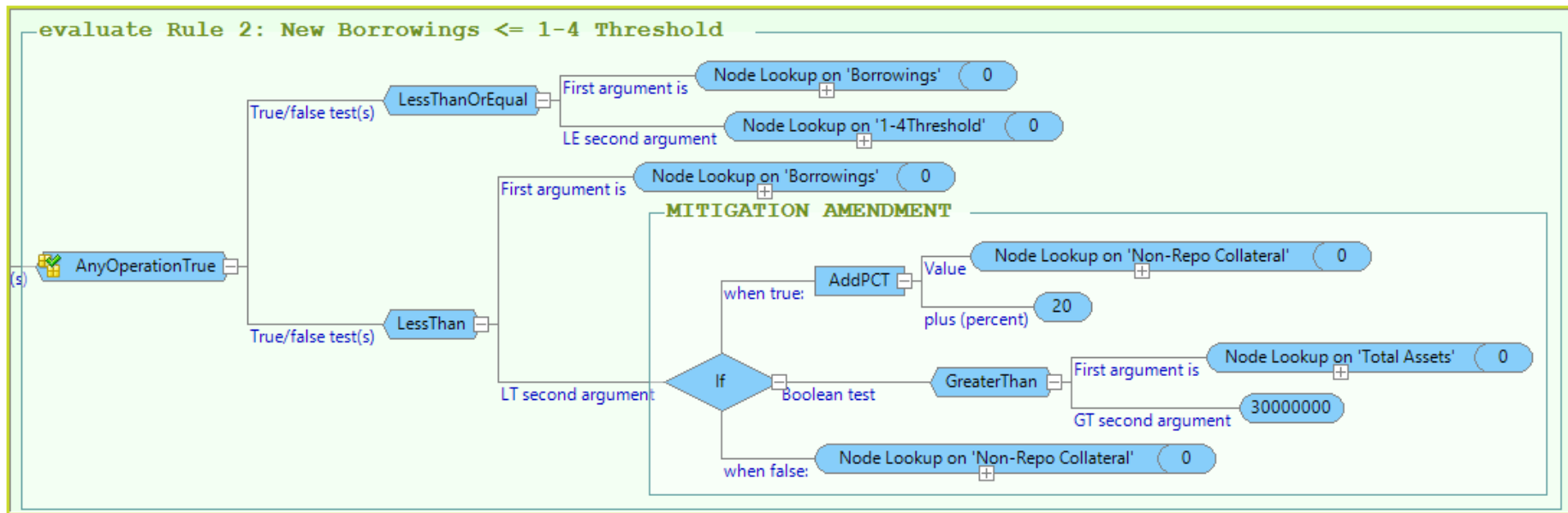


Figure 3: Amended Rule # 2 Formula.

As Bank One has Total Assets over \$30,000,000 the Non-Repo Collateral amount has increased by 20% i.e. the maximum borrowing amount for each customer is now:

- ✓ ABC Bank: < \$2,500,000
- ✓ Bank One: < \$3,900,000

THE DEBUGGER

To test the decision model, data can be easily imported or entered into the Debugger pane (see figure 4 below), and executed in the decision model. Execution can be halted at any point during runtime and the contents of the formula inspected via the Formula Palette to assist with explaining why decisions behave in the manner they do.

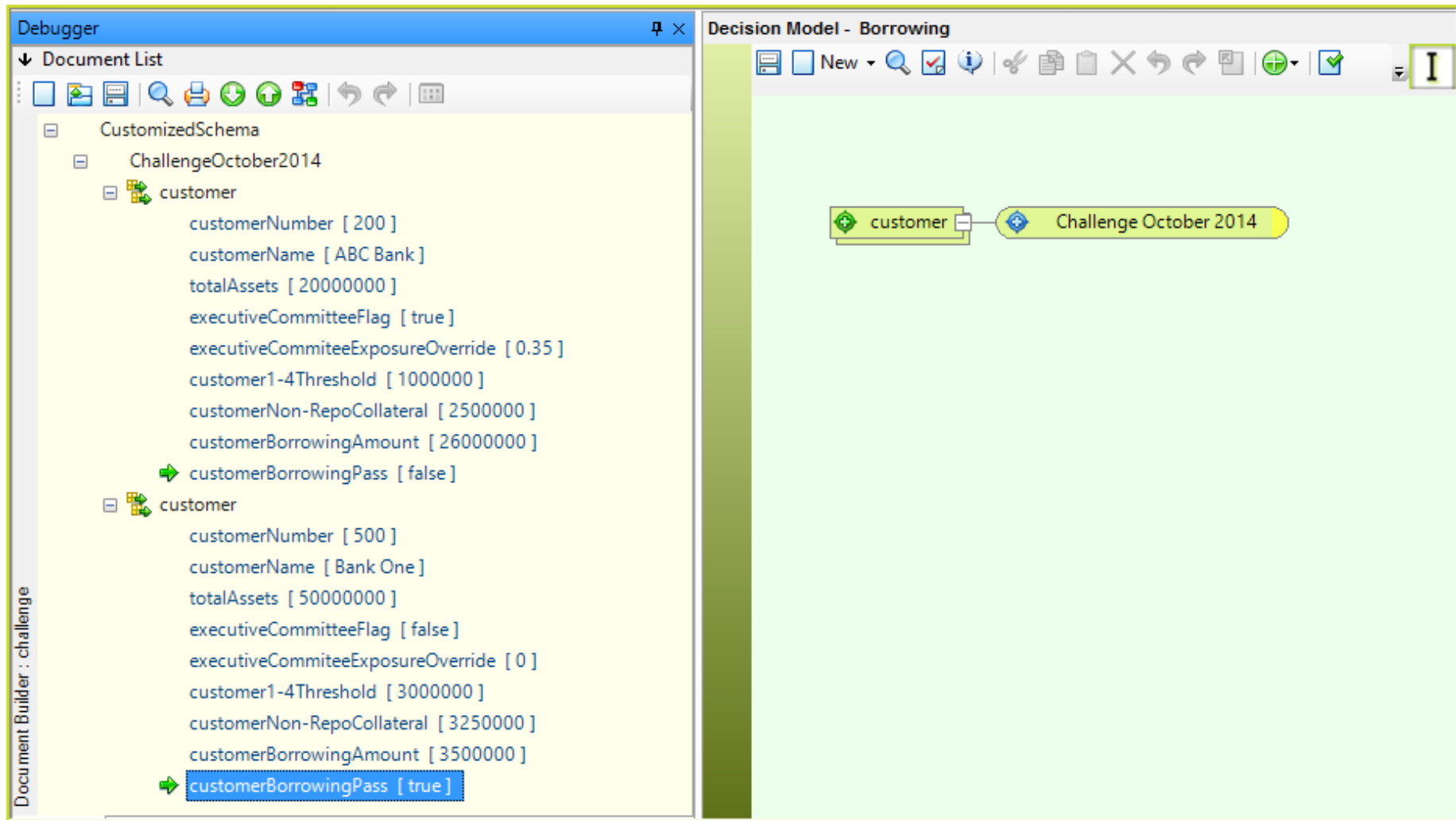


Figure 4: IDIOM Decision Manager Debugger.

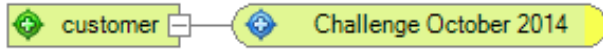
Appendix A

***Challenge October 2014
Amended
Borrowing***

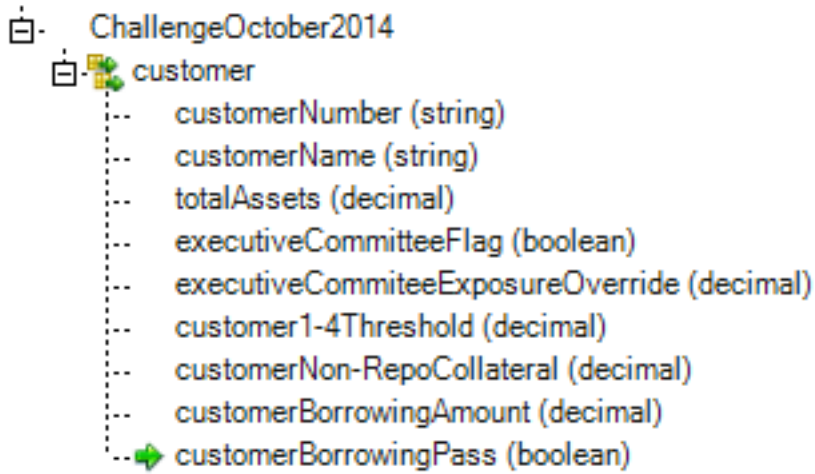
Business Description:

Decision Model: "Borrowing PASS/FAIL Decision with Mitigation Criteria"

Decision Model: Borrowing



SCHEMA DETAILS: challenge



Schema Annotations:

/ChallengeOctober2014
October Challenge 2014

DECISIONGROUP DETAILS

customer

ID	JE3vHQ12XECD7z6pdzJoPA		
Context Node	/ChallengeOctober2014/customer		
Parent	Borrowing (DecisionModel)		
Execution Order	0		
Action	Update	Created By	SystemAdministrator
Repeats	false		
Tags	(No tags found)		
Business Description	(No Description found)		
Technical Description	(No Description found)		

Execution List:

[Challenge October 2014](#)

DECISION DETAILS

Challenge October 2014

ID	xtKppEWxuUWHfr3c6H4QIlw		
Context Node	/ChallengeOctober2014/customer/customerBorrowingPass		
Parent	customer (DecisionGroup)		
Execution Order	0	Data Type	boolean
Action	CreteIfNecessary	Created By	SystemAdministrator
Repeats	false		
Tags	(No tags found)		
Business Description	(No Description found)		
Technical Description	(No Description found)		

Formula References:

- [1753-01-01 to 9998-12-31] [Challenge October 2014](#)

LIST OF FORMULAS BY SCHEMA

challenge

[Challenge October 2014](#)

- [1753-01-01] [Challenge October 2014](#)

FORMULA DETAILS

Challenge October 2014

Context Node	/ChallengeOctober2014/customer/customerBorrowingPass		
Private?	False	Data Type	boolean
Created By	SystemAdministrator		
Business Description	(No Description found)		
Technical Description	(No Description found)		

Versions:

- [1753-01-01] [Challenge October 2014](#)

FORMULA VERSION DETAILS

Challenge October 2014

Context Node	/ChallengeOctober2014/customer/customerBorrowingPass		
Status	Complete	Data Type	boolean
Effective Date	1753-01-01	Created By	SystemAdministrator
Calculation Mode	Use 'int' for whole number calculations		

Business Description

The english language description of this rule is ambiguous. There is no indication whether either, or both rules must pass for a pass. If it is 'either', then the high order 'AllOperationsTrue' would be replaced by 'AnyOperationTrue'. We have followed the interpretation used by others.

Technical Description

Can be generated as Java or C#.

Alias Legend


1-4Threshold	/ChallengeOctober2014/customer/customer1-4Threshold
Borrowings	/ChallengeOctober2014/customer/customerBorrowingAmount
Executive Committee Exposure Override	/ChallengeOctober2014/customer/executiveCommitteeExposureOverride
Executive Committee Flag	/ChallengeOctober2014/customer/executiveCommitteeFlag
Non-Repo Collateral	/ChallengeOctober2014/customer/customerNon-RepoCollateral
Total Assets	/ChallengeOctober2014/customer/totalAssets

FORMULA VERSION DEFINITION

The Formula Version "Challenge October 2014" is defined as follows.

Perform the following series of tests. This operation will return true only when ALL tests in the series are true:

- The first test will **evaluate Rule 1: Borrowings cannot exceed 30% of Total Assets.**
- The second test will **evaluate Rule 2: New Borrowings <= 1-4 Threshold**

 A: The largest of: ¹

- The first operation to test for largest value is Total Assets * 30%
- The second operation to test for largest value is When Executive Committee Flag is true
 - THEN return Total Assets * Executive Committee Exposure Override%
 - ELSE return 0

Evaluate Rule 1: Borrowings cannot exceed 30% of Total Assets. is defined as follows:

Return true when Borrowings <= A

Evaluate Rule 2: New Borrowings <= 1-4 Threshold is defined as follows:

Perform the following series of tests. This operation will return true when at least ONE test in the series is true:

- The first test will return true when Borrowings <= 1-4Threshold
- The second test will return true when Borrowings < **MITIGATION AMENDMENT**

MITIGATION AMENDMENT is defined as follows:

When Total Assets > 30000000

- THEN return Non-Repo Collateral + 20%
- ELSE return the value of Non-Repo Collateral

¹ Use higher value if the Executive Committee Flag is 'true'

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